

WHAT IS CLAIMED IS:

1. A debris collection device for limiting the dispersion of airborne particles comprising:

(a) a vehicle with a plurality of wheels, at least one wheel being maneuverable by a selectively operable steering mechanism and at least one wheel providing propulsion;

(b) a debris contacting mechanism which contacts debris and moves said debris in a direction which is substantially the same as the direction of forward movement of the vehicle, said contacting mechanism being configured to move said debris away from the surface that is intended to be cleaned of debris;

(c) a debris transport mechanism including an inlet located proximal to said debris contacting mechanism and being configured to receive debris moved by said debris contacting mechanism at an inlet and move said debris towards a debris storage compartment, wherein the operation of said debris collection device including the debris contacting mechanism generates airborne particles in the area proximate to the inlet of said transport mechanism such that the airborne particles would disperse into the air unless processed by the debris collection device;

(d) a filter and vacuum assembly including an inlet disposed downstream of the inlet of said transport mechanism and upstream of the debris storage compartment relative to the path of transported debris, said filter and vacuum assembly generating a primary air flow that draws the airborne particles into the inlet of the transport mechanism, along a path proximate to the transport mechanism, into the inlet of the filter and vacuum assembly and through a filter located within the filter and vacuum assembly without generating a substantial air-flow through the storage compartment; and

(e) a shaking mechanism operably connected to said filter and arranged such that, upon operation of said shaking mechanism, debris is released from the filter and falls under gravity through the inlet of said filter and vacuum assembly and onto the debris transport mechanism, said debris transport mechanism carrying said released debris to said debris storage compartment where said released debris is deposited in said debris storage compartment without the presence of a significant air-flow that would tend to carry some of the released debris back into the filter.

2. The debris collection device of claim 1, wherein the debris contacting mechanism is a broom.

3. The debris collection device of claim 1, wherein the debris contacting mechanism is a cylindrical broom.

4. The debris collection device of claim 1, wherein the debris contacting mechanism is a broom that rotates.

5. The debris collection device of claim 1, wherein after the airborne particles pass through the inlet of the filter and vacuum assembly they travel a tortuous path before reaching the filter.

6. The debris collection device of claim 1, wherein the debris transport mechanism is deposited upon an incline such that debris received through said inlet may be deposited upon said debris transport mechanism in a manner where gravity and friction will maintain the debris upon the transport mechanism.

7. The debris collection device of claim 1, wherein the debris transport mechanism is deposited upon an incline such that debris received through said inlet may be deposited upon said debris transport mechanism in a manner where gravity and friction will maintain the debris upon the transport mechanism for a period of time until a cleat or scoop will support the debris.

8. The debris collection device of claim 1, wherein the debris transport mechanism includes a conveyor belt having cleats.

9. The debris collection device of claim 1, wherein the vehicle includes three wheels where two of the wheels are spaced-apart near the front of the vehicle and one wheel is operatively linked to the steering mechanism and is located near the rear of the vehicle.

10. The debris collection device of claim 1, wherein the vehicle includes four wheels.

11. The debris collection device of claim 1, wherein the airborne particles include debris.

12. The debris collection device of claim 1, wherein substantially none of the airborne particles contact the filter more than one time during debris collection and the lifetime of the filter.

13. The debris collection device of claim 1, wherein the shaking of the filter occurs automatically.

14. The debris collection device of claim 1, wherein the shaking of the filter occurs automatically based upon air pressure present in the filter and vacuum assembly.

15. The debris collection device of claim 1, wherein less than about 10% of the collected debris enter the filter and vacuum assembly.

16. A debris collection device for limiting the dispersion of airborne particles comprising a vehicle with a plurality of wheels, at least one wheel being maneuverable by a selectively operable steering mechanism and at least one wheel providing propulsion; a debris contacting mechanism which contacts debris and moves said debris in a direction which is substantially the same as the direction of forward movement of the vehicle, said contacting mechanism being configured to move said debris away from the surface that is intended to be cleaned of debris; a debris transport mechanism including an inlet located proximal to said debris contacting mechanism and being configured to receive debris moved by said debris contacting mechanism through said inlet and carry said debris towards a debris storage compartment, said debris transport mechanism being disposed on an incline such that debris received through said inlet may be deposited upon said debris transport mechanism such that gravity and friction will maintain the debris (or at least a substantial proportion of the debris) upon the transport mechanism without the assistance of a scoop or a cleat for a sufficient amount of time to facilitate transportation, wherein the operation of said debris collection device including the debris contacting mechanism generates airborne particles in the area proximate to the inlet of said transport mechanism such that the airborne particles would disperse into the air unless processed by the debris collection device; and a filter and vacuum assembly including an inlet disposed downstream of the inlet of said transport mechanism relative to the path of the transported debris, said filter and vacuum assembly generating a primary air flow that draws the airborne particles into the inlet of the transport mechanism, along a path proximate to the transport mechanism, and into the inlet of the filter and vacuum assembly.

17. The debris collection device of claim 16, wherein the debris transport mechanism includes a conveyor belt which is continuous.

18. The debris collection device of claim 16, wherein the debris transport mechanism includes a conveyor belt with cleats spaced apart from each other.

19. The debris collection device of claim 16, wherein the debris transport mechanism includes a conveyor belt with cleats such that the cleats support the debris after the debris is maintained on the conveyor belt by gravity and friction.

20. The debris collection device of claim 16, wherein the debris transport mechanism maintains the debris by gravity and friction until the debris is delivered to the storage compartment.

21. The debris collection device of claim 16, wherein the storage compartment has an internal volume of at least about 2 cubic yards.

22. The debris collection device of claim 16, wherein the storage compartment includes a port for connecting a portable debris collection device.

23. The debris collection device of claim 22, wherein the portable debris collection device is a suction hose.

24. The debris collection device of claim 22, wherein during the use of the port a secondary air flow is generated which is insignificant in relative comparison to said primary air flow.

25. A debris collection device for limiting the dispersion of airborne particles comprising:

- (a) a vehicle with a plurality of wheels, at least one wheel being maneuverable by a selectively operable steering mechanism and at least one wheel providing propulsion;
- (b) a debris contacting mechanism which contacts debris and moves said debris in a direction which is substantially the same as the direction of forward movement of the vehicle, said contacting mechanism being configured to move said debris away from the surface that is intended to be cleaned of debris;

(c) a debris transport mechanism including an inlet located proximal to said debris contacting mechanism and being configured to receive debris moved by said debris contacting mechanism, said debris transport mechanism being deposited on an incline such that debris received through said inlet may be deposited upon said debris transport mechanism such that gravity and friction will maintain the debris upon the transport mechanism without the assistance of a scoop or a cleat for a sufficient amount of time to facilitate transportation;

(d) a driving mechanism connected to said debris transport mechanism, said driving mechanism imparting movement to said transport mechanism which tends to move the debris away from said debris contacting mechanism and towards a debris storage compartment, wherein the operation of said debris collection device including the debris contacting mechanism generates airborne particles in the area proximate to the inlet of said transport mechanism such that the airborne particles would disperse into the air unless processed by the debris collection device; and

(e) a filter and vacuum assembly including an inlet disposed downstream of the inlet of said transport mechanism and upstream of the debris storage compartment relative to the path of transported debris, said filter and vacuum assembly generating a primary air flow that draws the airborne particles into the inlet of the transport mechanism, along a path proximate to the transport mechanism, and into the inlet of the filter and vacuum assembly without generating a significant air flow through the storage compartment.